

HOSPITAL BED TABLE WITH A VIDEO DISPLAY

RELATED APPLICATIONS: This application claims priority to application S.N. 60/431,460 filed on December 6, 2002 and incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of Invention

This invention pertains to a table adapted for positioning above a hospital bed and incorporating a video display. The display is movable between an upright or operational position and a horizontal position.

Description of the Prior Art

Hospital patients frequently require access to TV services and other forms of entertainment and means of occupying their time, especially if they are bed-ridden. Some hospitals have rooms equipped with wall-mounted TVs. Other hospitals use television stands (See, for instance, U.S. Patent No. 5,207,405) that can position a TV near a hospital bed.

However, even with these types of stands, the patients are dissatisfied since they desire other systems that, in addition, to TV services, may provide other functions, such as an interactive PC-type system with entertainment software, including Internet access. Moreover, since patients also require a table for eating, TV stands further clutter the space around the patient's bed and make it difficult for the patient, doctors, nurses, visitors to move around.

SUMMARY OF THE INVENTION

In view of the above, a table is provided in the present invention that includes a video display associated with a PC-type controller. The table is preferably mounted on a rolling frame and is constructed and arranged so that it is positioned over a hospital bed so that it can be used by a patient. With the present modification, the patient can use the table for normal activities and in addition allows the patient to watch tv programs on the video display, or use the controller together with a keyboard to operate various software and/or access the Internet.

Preferably, a table and display assembly according to this invention includes a table having a platform; and display system attached said platform and including a case with signal receiving and processing circuitry and a screen connected to said circuitry and adapted to receive video signals and to display images corresponding to said video signals. The display system may include a pivoting arm attached to said screen to pivot said screen between a viewable position and a rest position, with the screen facing the platform in the rest position.

The system also includes a mounting member such as a clamp for selectively installing and removing said system from said table.

Preferably the table is a bedside table used in a hospital.

In another aspect of the invention, a display system includes a support structure; a screen adapted to receive signals and to display images from said signals, said screen being attached to said support structure; and a mounting member adapted to mount said support structure on a platform.

Preferably, the screen is a flat screen.

The support structure may includes a first arm secured to said mounting member and a second arm mounted between said first arm and said screen. The support structure may include a bracket supporting said screen, said second arm being coupled to said bracket.

Preferably the support structure is adapted to provide rotation of said screen along at least one axis, and preferably two axes, independently.

The system further includes a case attached to said support structure and electronic circuitry disposed in said case and adapted to receive signals and to transmit said signals to said screen. Preferably the electronic circuitry is a PC.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows a perspective view of a table constructed in accordance with this invention with the display in the open position;

Fig. 2 shows a side elevational view of the table of Fig. 1;

Fig. 3 shows a perspective view of an alternative embodiment constructed in accordance with this invention with the display in the open position;

Fig. 4 shows a side elevational view of the table of Fig. 3 with the display in the closed position;

Fig. 5 shows a side elevational view of a table with an alternate embodiment of the invention; and

Fig. 6 shows a perspective view of the embodiment of Fig. 5.

DETAILED DESCRIPTION OF THE INVENTION

As shown in Figures 1 and 2 the table T has a U-shaped configuration having a base B mounted on coasters, an upright U and a platform P. The height of the platform P can be changed in the usual manner by adjusting the length of the upright U to allow the platform P to be positioned in a cantilevered fashion over a hospital bed (not shown). These types of tables are available from several suppliers.

A video assembly 10 is attached to the table. It includes an LCD video display 12, a control module 16, a tuner section 14 and a support structure 18 that supports these elements on the table. Preferably the video display includes integral speakers (not shown) to allow the patient to hear the audio portion of the respective program. Alternatively, external speakers may be provided.

The tuner section 14 allows a patient to select the program that he wants to watch and provides audio-video signals to the video display 12. Preferably the following components may be used.

The LCD video display 12 could be a 15" flat plasma screen monitor made by Amptron -Model No. LSEX-TA or equivalent.

The control module 16 could be a thin client computing appliance such as a 'EON ANYTHING BOX' made by Neoware, or equivalent.

The tuner section 14 could be Viewsonic Model No.VBSOHRTV or equivalent.

Obviously other components may be used as well.

These components are electrically connected to each other by cables that have been omitted for the sake of clarity. In addition, the tuner section 14 is also connected by a suitable cable to an external video signal source to provide the video programs and to an ac outlet to provide power to the assembly.

The support structure 18 includes a bracket 3, an L-shaped arm 13 and a lower arm 1A. These elements are channels made of steel, aluminum or other similar material that is strong enough to support the display assembly. The channels provide internal pathways which can be used to run the cables interconnecting the components described above.

The bracket 3 is provided with a mounting leg 20. The mounting leg 20 is secured rigidly to the bottom surface of platform P by screws 6 and a mounting plate 5.

Attached laterally to the bracket 3 is a housing 2. This housing 2 is sized and shaped to hold the tuner section 16 as shown. The front portion of the housing is open to allow the tuner section 16 to be readily removed by the patient or an attendant.

Lower arm 1A has a pivoting joint or bushing 1B (including screw 7) that joins it to the lower end of bracket 3. The opposite end of the lower arm 1A supports a housing 4. This housing 4 holds the control module 14. The housing 4 is provided with cutouts that allow the removal of the control module 14. Preferably, the bottom of the housing 4 is provided with one or more holes (not shown). The cables connected to the control module 14 pass through these holes and are connected to the control module 14. The joint 1B allows the arm 1A and the housing 4 to pivot with respect to the bracket 3 by up to 90 degrees to allow the insertion and/or removal of the cables from the control module 14.

The arm 13 has a joint or bushing 28 (including a standard screw 7A) at its lower end to pivotally connect it to the bracket 3. The upper end of the arm 13 is provided with two swivel-type joints or bushings 30 and 32. Joint 30 is directly attached to the arm 13 while joint 32 is attached to a mounting plate 34. The mounting plate is

attached to the back of display 12. The joints 28, 30, and 32 provide several degrees of movement for the display 12. First, the display 12 can move from a vertical or open position shown in Fig. 1 to a closed or rest position shown in Fig. 2 (at 12A) by pivoting the arm 13 at joint 28. This motion is indicated in Fig. 2 by arrow Z. The open position is the operational position of the display because it can be viewed in this position by the patient. The display 12 can be pivoted to the closed position when the patient does not desire to see a program.

Additionally, the display 12 can be pivoted along joint 30 slightly up and down with respect to the bracket 3 as indicated by arrow X in Fig. 1. The position of the display can also be adjusted laterally by pivoting it along joint 32 as indicated by arrow Y in Fig. 1.

If desired the components 12, 14, 16 can be adapted to provide the patient access to the Internet. For this purpose, the system may also include a keyboard (not shown).

Figs. 3 and 4 show an alternate embodiment of the invention. In this embodiment, a table T1 is provided with a platform P1 supporting a TV display assembly 100. The assembly 100 includes three components: a support structure 110, a PC case 112 and a video display 114.

The support structure includes a clamp assembly 120. The clamp assembly 120 includes a top horizontal member 122, a bottom horizontal member 124 and a vertical member 126 connecting the two horizontal members. Two or more bolts (not shown) are used to clamp the two horizontal members 122, 124 to the platform P1.

Of course, other structures may be used to attach the display system to the table

platform.

The support structure 110 further includes a lower arm 130, an L-shaped upper arm 132 and a mounting bracket 134. The lower arm 130 is connected to the clamp 120 and is joined to the upper arm 132 by a bushing 136 that allows the upper arm 134 to pivot with respect to the lower arm 130 along a horizontal axis. The upper arm 132 is connected to the bracket 134 by a bushing 138 that allows the bracket to pivot about a horizontal axis. The bracket 134 includes a third bushing 140 that allows a portion 142 of the bracket to pivot with respect to the arm 132 about a vertical axis. This portion 142 is secured to, and supports the display 114. The bushings 138, 140 allow the display 114 to be positioned at a comfortable viewing angle. The bushing 136 allows the display to be pivoted between the upright position shown in Fig. 3 and a horizontal, or rest position shown in Fig. 4 in which the display can be resting on the platform P1.

The case 112 is similar to a standard PC case and is attached to the lower arm 130 and/or clamp 120. The case has several cutouts 142. The case 112 is used to hold a PC circuitry 144 including a mother board, CD and DVD drives, etc. (not shown). A CD disc, a DVD disc or other similar media may be inserted through cutouts 142. The case is also provided with a card reader 146 that may be coupled to the PC circuitry 144 through a USB port or other similar means (not shown). This reader allows a patient or other individuals to order services on line, to provide an identification means for certain restrictive functions, etc.

The video display 114 is pivotable between two positions, as described above, and may be provided with a video camera 148 with a built-in microphone and a touch screen 150. The touch screen 150 allows the patient to generate commands for the PC

circuitry 144. The video display 114 may be an LCD type, a plasma type or other similar screen that is relatively thin and has a low power consumption. The connectors between the display 114 and the PC circuitry 144 are passed through the support structure 110. The assembly may also be provided with a wired or wireless keyboard and/or mouse.

A major difference between the two embodiments is that in the first embodiment of Figs. 1 and 2, the table is constructed at the same time and integral with the display assembly. In the embodiment of Figs. 3 and 4 the screen assembly can be added to an existing bedside table by the clamp 120. Another difference is that in the first embodiment, a thin or flat screen is provided with receives analog TV signals from the tuner 16. In the second embodiment, the display 114 is computer-type monitor that receives signals from the PC circuitry 144. The signals may be received through a cable connection, via a wired or wireless interconnection, etc. If a tuner is necessary, it is incorporated into the PC circuitry 144.

Figs. 5 and 6 show a third embodiment of the invention, In this embodiment a standard table T is provided with the usual base B and platform P. The platform P can be shifted vertically in the usual manner. The base B is formed with support legs L mounted on casters C. In this embodiment, the display assembly 200 includes a horizontal base plate 210 with one or more casters 212. The base plate is secured to the legs L by two tie members 214. The base plate 210 supports a pole 216 having a circular cross-section. The pole 216 may have other cross-sections as well. Mounted on the pole is a support sleeve 218 that is slidable on the pole 216 and is clamped to the platform P. The purpose of the support sleeve is to secure the pole 216 in the

vertical position shown.

Above platform P, there is a second sleeve 220 supporting a bracket 222. The second sleeve 220 can be positioned vertically at will along the pole 216 to thereby position display 226. The bracket 222 is connected to the second sleeve 220 through two bushings or joints 228, 230 that allow the display 226 to be rotated slightly either up or down, or sideways, as desired by the patient. Also mounted on the pole is a PC case 232 similar to the case 112. The PC circuitry is disposed in the PC case 232.

In all the embodiments discussed above, the PC circuitry is disposed in its own case. In some instances, the PC circuitry may be integrated into the display 114, 226, in which the respective PC case may be omitted.

The display assembly described herein has several advantages over the prior art, as follows. While existing TVs are placed far away from the patient, the present screen can be located close to the patient so that the patient can see it easier. In addition, the touch screen further facilitates interaction between the patient and the system.

While most prior art TV screens consist of large, power hungry CRT tubes, the present display preferably consists of a flat panel screen that uses less energy, requires less space and is easily movable within the hospital room by a patient, nurse, attendant, etc.

The invention provides a PC that can be used not only for communications, entertainment, (e.g., IP telephony, conferencing, Internet access, games) etc. by the patient, but may also be used to transmit and receive information by other bedside personnel.

The embodiments of Figs. 3, 4, 5 and 5 can be easily implemented by incorporating the display into a new table or by mounting it on an existing table.

While wall mounted TVs are permanent fixtures, the present display assembly can be easily placed into any hospital room, and removed to storage at will. Moreover, the assembly can be made modular so that some patients may need and receive only TV service, other patients may be provided a PC programmed to provide conferencing, telephone communications, and/or other functionality.

The invention allows a hospital to get a high speed (such as T1) digital connection and to distribute services to the patient bedside, including TV services and other services through its internal secure network. In this manner, the hospital can also provide high speed and secure data transmission to the patient bedside to be used by health professionals as well.

In addition to the functions described above, the display assembly can be used to provide other functions and services. As described above, the assembly can be used to provide IP telephony. Through this protocol, the patient can talk to various friends and relatives. Moreover, with the use of the camera 148, the participants in a telephone conversation or conference can also see each other (assuming, of course, that the other parties also have suitable cameras). However, the system can be used to provide a three-way communication between the patient, hospital personnel (a nurse, a doctor, etc.) and an interpreter. Thus, if the patient and the doctor do not share a language, they can talk to each other through an interpreter. While a voice-only connection may be sufficient, the use of video and voice connection is much more convenient in such a situation. Moreover, similar communications may be established

with other third parties, such as insurance carriers. An important variation on this function is to provide communication with a deaf person through a sign-language interpreter. In another variation, the assembly includes a Braille keyboard so that it can be operated by a blind patient.

The assembly may also be used to provide the patient with means of checking his bill, means of asking questions from the administration, means of receiving messages from the administration or medical staff, means of checking out from the hospital, etc.

The display assembly has been described in conjunction with a hospital bed. The display assembly may also be mounted on another type of table used in other environments, such as courts, law offices, immigration services, etc.

While the invention has been described with reference to several particular embodiments, it is to be understood that these embodiments are merely illustrative of the principles of the invention. Accordingly, the embodiments described in particular should be considered as exemplary, not limiting, with respect to the following claims.